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10/559,615	12/02/2005	Youichi Nanba	Q76011	1679

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
CHUO, TONY SHENG HSIANG	
ART UNIT	PAPER NUMBER
1729	

NOTIFICATION DATE	DELIVERY MODE
07/29/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sughrue@sughrue.com
PPROCESSING@SUGHRUE.COM
USPTO@SUGHRUE.COM

Office Action Summary	Application No.	Applicant(s)	
	10/559,615	NANBA ET AL.	
	Examiner	Art Unit	
	TONY CHUO	1729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 May 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-13,15-23 and 26-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-13,15-23 and 26-30* is/are rejected.

7)☒ Claim(s) *7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/8/11 has been entered.

Response to Amendment

2. Claims 1-5, 7-13, 15-23, and 26-30 are currently pending. Claims 6, 14, 24, 25, 31, and 32 are cancelled. The amended claim 1 does overcome the previously stated 103 rejections based on Yamada. However, the amended claim 1 does not overcome the previously stated 102/103 rejection based on Sudo et al. Therefore, upon further consideration, claims 1-5, 7-13, 15-23, and 26-30 are rejected under the following 102 and 103 rejections.

Claim Objections

3. Claim 7 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper

dependent form, or rewrite the claim(s) in independent form. Claim 7 depends on cancelled claim 6.

Claim Rejections - 35 USC § 102/103

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-5, 7-9, 11-13, 15-23, and 26-30 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sudo et al (WO 03/028128).

Regarding claims 1, 2, and 26-29, the Sudo reference discloses a lithium secondary battery comprising an electrode made of a molded product of an electrode paste comprising a carbon powder and binder, wherein the carbon powder is produced by causing raw materials of a polymer to permeate into carbonaceous particles and subsequently curing (polymerizing) the raw materials, followed by thermal treatment at a temperature of 2900℃; wherein the curing is carried out under heating at a temperature

of 150℃; wherein the carbonaceous particles have an average particle size of 10 to 25 μm (page 31, lines 16-18, page 32, lines 13-15, page 33, lines 27-28 and Example 1).

Examiner's note: The examiner takes the position that "a graphite crystal structure region and an amorphous structure region are distributed throughout the entirety of a particle constituting the carbon material from the surface of the particle to a center portion thereof and which has a substantially uniform structure from the surface to the center portion of the particle" is an inherent characteristic of the Sudo carbon powder because Sudo teaches the same carbonaceous particles and polymer that are formed by a deposition process that inherently impregnates the carbonaceous particle from the surface to the center portion. The examiner contends that the process of stirring a solution of natural graphite particles and varnish A (raw materials of a polymer) for 30 minutes in a planetary mixer is sufficient to impregnate the graphite particles from the surface to the center portion with the polymer (See Example 1). Burden is on the applicant to show differences in product comparison.

Regarding claims 3 and 4, it also discloses polymer that is selected from the group consisting of phenol resin, polyvinyl alcohol resin, furan resin, cellulose resin, polystyrene resin, polyimide resin, and epoxy resin; wherein phenol resin is more preferred (page 18, lines 17-21).

Regarding claim 5, it also discloses drying oil or fatty acid derived therefrom that is added during the course of reaction of the phenol resin raw material (page 18, lines 22-29).

Regarding claim 7, an area ratio of a graphite crystal structure region having diffraction pattern formed of two or more spots to an amorphous structure region having a diffraction pattern formed of only one spot attributed to (002) plane is 99 to 20 : 1 to 70 is an inherent property of a graphite particle that has been impregnated with a phenol resin polymer and heat treated at 2900℃.

Regarding claim 8, it also discloses performing multiple times a process of causing the polymer raw materials to deposit and permeate into the graphite particles and subsequently polymerizing the organic compound, followed by thermal treatment (page 26, lines 18-26).

Regarding claim 9, it also discloses an amount of phenol resin that is 4 to 25 mass% (page 21, lines 16-18).

Regarding claim 11, it also discloses a boron carbide that is incorporated into the carbonaceous powder in an amount of 0.1 to 5 mass% which corresponds to an amount of 10 to 5,000 ppm (See page 31, lines 4-7).

Regarding claim 12, it also discloses adding boron in subsequent heat treatment which is after polymerization of the polymer (page 27, lines 6-8).

Regarding claim 13, it also discloses carbonaceous particles that includes petroleum based coke, coal-based coke, and natural graphite (page 15 line 31 to page 16 line 2).

Regarding claims 15-22, it also discloses carbon fiber that is deposited onto the surface of the carbon powder, wherein the carbon fiber has a filament diameter of 2 to 1,000 nm, wherein the amount of carbon fiber is preferably 2 to 10 mass%, wherein the

carbon fiber is vapor grown carbon fiber having an aspect ratio of 10 to 15,000, wherein the vapor grown carbon fiber is graphitized carbon fiber which has undergone thermal treatment at 2,000 to 3,000℃, wherein the fiber filament of the vapor grown carbon fiber includes a hollow space extending along its center axis, wherein the vapor grown carbon fiber contains branched carbon fiber filaments, wherein the vapor grown carbon fiber has at (002) plane, an average interlayer distance (d_{002}) of 0.3395 nm or less as measured by x-ray diffraction (page 21 line 20 to page 24 line 23).

Regarding claim 23, it also discloses a carbon material that has a specific surface area of 3 m^2/g or less as measured through a BET method (page 32, lines 16-19).

Regarding claim 30, it also discloses a non-aqueous electrolytic solution, wherein the non-aqueous solvent employed for the non-aqueous electrolytic solution contains at least one selected from the group consisting of ethylene carbonate, diethyl carbonate, dimethyl carbonate, methyl ethyl carbonate, propylene carbonate, butylene carbonate, and vinylene carbonate (page 37, lines 7-10).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo et al (WO 03/028128) in view of Yamada (JP 10-116605). The Sudo reference is applied to claim 9 for reasons stated above.

However, Sudo et al does not expressly teach an amount of the organic compound that is 100 to 500 parts by mass on the basis of 100 parts by mass of the carbonaceous particles. The Yamada reference discloses an amount of thermosetting resin (organic compound) that is 0.5 to 2 parts by weight to 1 part by weight of the carbon (paragraph [0018]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Sudo carbon powder to include an amount of the organic compound that is 100 to 500 parts by mass on the basis of 100 parts by mass of the carbonaceous particles that in order to utilize sufficient organic compound to provide an electrode active material with large charge and discharge capacity and excellent cycle characteristics. In addition, in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

Response to Arguments

9. Applicant's arguments, see Remarks, filed 4/8/11, with respect to Yamada have been fully considered and are persuasive. The 35 USC 103 rejections of claims 1-5, 7-13, 15-23, and 26-30 have been withdrawn. However, applicant's arguments regarding Sudo et al have been fully considered but they are not persuasive.

The applicant argues that the present specification describes granulated natural graphite in Example 2. The graphite of Example 2 satisfies the requirements as defined in the present claims. Meanwhile, the natural graphite in Comparative Example 1 of the present specification does not satisfy the requirements of the claims. There are two types of natural graphite. The natural graphite in Example 2 comprises amorphous structure regions which were generated by being subjected to mechanical stress at the time of granulating. The natural graphite disclosed in Example 1 of Sudo et al is massive (lump- shaped) natural graphite.

In response, there is no limitation in the claims that require granulated natural graphite comprising amorphous structure regions which were generated by being subjected to mechanical stress. In addition, there is no evidence to show that granulated natural graphite comprises amorphous structure regions. This argument appears to be based on opinion and not based on any factual evidence because the specification does not disclose granulated natural graphite comprising amorphous structure regions. Further, the specification discloses that the natural graphite in Comparative Example 1 has an area ratio of crystalline carbon regions to amorphous carbon regions. Therefore, the examiner contends that the Sudo natural graphite inherently has a graphite crystal structure region and an amorphous structure region.

The applicant further argues that carbon derived from phenol resin in Sudo et al is amorphous carbon, even after it is heated at a high temperature and that this means that the surface having a large amount of the resin in Sudo et al becomes amorphous-

rich carbon. Accordingly, the crystallinity in Sudo et al becomes non-uniform on the surface and at the core of the obtained particles.

In response, the examiner maintains the contention that the phenol resin in Sudo is uniformly impregnated into the carbon particle. Therefore, there is no evidence to show that the crystallinity in Sudo et al becomes non-uniform on the surface and at the core of the obtained particles.

The applicant further argues that the polymer of Sudo et al has high viscosity and has difficulty in permeating into the carbon particles, though the polymer may attach onto the carbon surface.

In response, the examiner disagrees that the polymer of Sudo et al has high viscosity and has difficulty in permeating into the carbon particles. Sudo et al discloses diluting the phenol resin with an ethanol solvent which reduces the viscosity of the phenol resin. Therefore, polymer of Sudo et al would not have difficulty in permeating into the carbon particles.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TONY CHUO whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ula Ruddock can be reached on (571) 272-1481. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

/ULA C. RUDDOCK/
Supervisory Patent Examiner, Art Unit 1729